R&S®ESCI7
EMI Test Receiver
Compliance measurements in line with commercial standards up to 7 GHz

7 Years of Driving Innovation

ROHDE&SCHWARZ

Test & Measurement

Product Brochure | 01.00

R&S®ESCI7 EMI Test Receiver

At a glance

The R&S®ESCI7 EMI test receiver is a standard-compliant measuring receiver for EMC certification measurements in line with commercial standards in the frequency range from 9 kHz to 7 GHz. The receiver conforms to the latest version of the CISPR 16-1-1 basic standard. At the same time, it functions as a full-featured and powerful spectrum analyzer for lab applications.

In line with the latest version of commercial EMC standards, the R&S®ESCI7 EMI test receiver measures and analyzes electromagnetic disturbances produced by devices, modules and components in the frequency range from 9 kHz to 7 GHz. It fulfills the requirements of the current CISPR 16-1-1 basic standard, including the average detector with meter time constant (CISPR-average) and the RMS-average detector.

Time-saving, automatic test routines considerably reduce the required effort. Effective analysis capabilities, clear presentation of results and straightforward, intuitive operation provide support to users in product development or type approval testing, for example.

In addition, the R&S®ESCI7 can be used as a high-quality spectrum analyzer. Diverse test functions for general measurements encountered in the lab extend the instrument's range of applications beyond pure disturbance measurements to provide additional benefit.

Key facts

- Combination of standard-compliant EMI test receiver and high-quality spectrum analyzer
- Integrated preselection with selectable 20 dB preamplifier
- Frequency range from 9 kHz to 7 GHz; usable for all commercial EMC standards
- Effective analysis of the disturbance spectrum through simultaneous graphical presentation of the disturbance level and emission spectrum around the receive frequency
- Time-domain analysis for evaluation of timing behavior of disturbances (e.g. click-rate analysis)
- Automatic consideration of coupling devices such as line impedance stabilization networks, probes, cables and antennas using transducer factors and sets

R&S®ESCI7 EMI Test Receiver

Benefits and key features

Standard-compliant disturbance measurements

- Characteristics
  - Total measurement uncertainty 1.0 dB (< 3 GHz) and 1.5 dB (3 GHz to 7 GHz)
  - 1 dB compression +5 dBm
  - Displayed average noise level with preamplifier typ. –153 dBm (10 Hz)
  - Twelve preselection filters up to 7 GHz
  - Resolution bandwidths in line with CISPR 16-1-1
  - Detectors: max./min. peak, quasi-peak, average, CISPR-average, RMS, RMS-average

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Spectrum analysis for lab applications

- High-quality spectrum analyzer included
- Extensive measurement functions and evaluation capabilities for general lab applications

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Intuitive operation and powerful EMI analysis functions for fast, accurate results

- User-friendly operation as with all EMI test receivers from Rohde&Schwarz
- SCAN settings in tabular format
- Simultaneous measurement of multiple traces for parallel evaluation
- Fast, reliable measurements using automatic and interactive test routines
- EMI test receiver and spectrum analyzer in a single box – display in MIXED MODE operation
- Continuous bargraph display and marker functions for precise measurements
- Time-domain analysis – oscilloscope function in receiver mode
- Automatic disturbance voltage measurements using remote-controllable line impedance stabilization networks (LISN) from Rohde&Schwarz
- Predefined transducer factors
- Library of limit lines for commercial standards

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Integrates perfectly into the work environment

- Easy expansion or upgrading by means of options
  - Scalar network analysis
  - RF level measurement
  - Modulation measurement
- Extensive documentation and networking capabilities like a PC
- Computer-controlled measurement of disturbances and automated EMI test routines using the R&S®ES-SCAN and R&S®EMC32 EMI measurement software
- Always up-to-date with free firmware updates

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Rugged and environmentally friendly, suitable even for field applications

- Housing option for outdoor use
  - Shock-absorbing corners, carrying handle, carrying bag
- AC-independent operation using DC power supply and battery pack (option)
- Flash disk option for expanded environmental specifications
- Environmentally friendly design
  - Small number of materials
  - Easy identification of materials through labeling
  - Recyclable housing

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Standard-compliant disturbance measurements

Characteristics

Full-compliance EMI test receivers are always used when certifications must be performed in line with relevant standards. CISPR 16-compliant measurements are extremely demanding for the test equipment since the equipment must be capable of handling a wide variety of disturbance signals. This includes pulsed and sinusoidal signals as well as modulated and intermittent signals, all of which must be correctly weighted.

The R&S®ESCI7 EMI test receiver is designed for such applications. With its integrated preselection with twelve fixed and tunable filters, a 20 dB preamplifier and a highly linear frontend, the instrument meets the requirements of commercial standards such as CISPR, EN, ETS, ANSI, FCC and VCCI. Other impressive characteristics include 1.0 dB total measurement uncertainty (up to 3 GHz) and a 1 dB compression point of +5 dBm. With its low displayed average noise level (typ. –153 dBm for 10 Hz bandwidth and preamplifier switched on), the R&S®ESCI7 can also be used to precisely measure very low-amplitude signals with a good signal-to-noise ratio.

The available weighting detectors including average with meter time constant (CISPR-average) and RMS-average as well as the EMC resolution bandwidths (200 Hz, 9 kHz, 120 kHz as 6 dB bandwidths, 1 MHz as impulse bandwidth) fulfill the current version of the CISPR 16-1-1 basic standard.

Measurement of radiated disturbances in line with the product standard CISPR 22:2005 Amend. 1:2005/ EN 55022:2006 Amend. 1:2007 for information technology equipment (ITE) in the range from 1 GHz to 6 GHz using the R&S®ESCI7 EMI test receiver and the R&S®HF907 double-ridged waveguide horn antenna.

Spectrum analysis for lab applications

High-quality spectrum analyzer included

Like all modern EMI test receivers from Rohde&Schwarz, the R&S®ESCI7 is based on a powerful spectrum analyzer platform. This relationship provides comprehensive measurement capabilities from the standard repertoire of a high-quality spectrum analyzer including disturbance measurements required in development (with preselection/preamplifier activated when required) and also many customized analyzer functions that help to significantly expand the range of possible applications beyond EMC measurements.

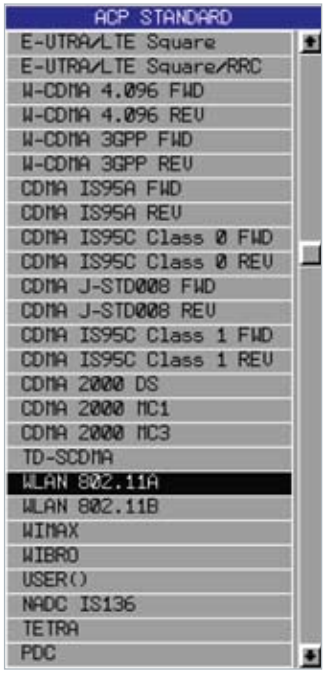
Extensive measurement functions and evaluation capabilities for general lab applications

For many of the typical lab measurements, the R&S®ESCI7 provides fast test routines such as the following:

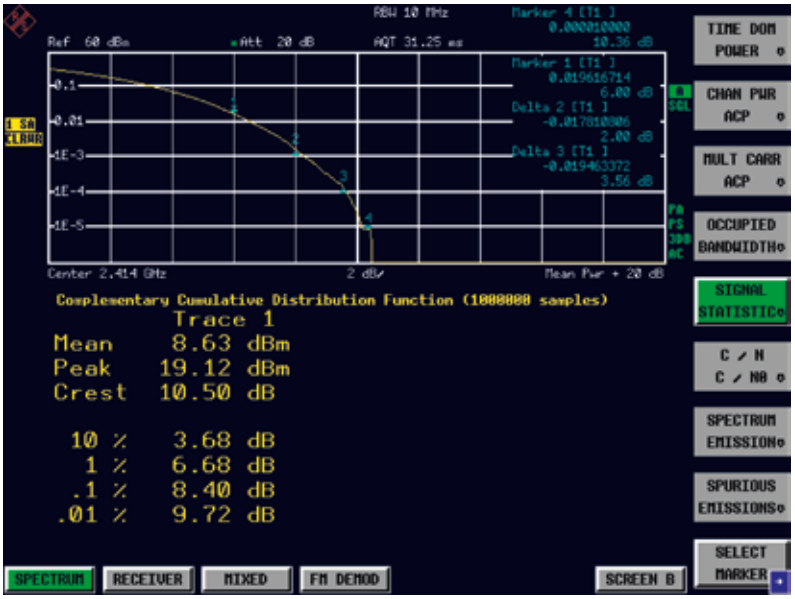
- Determination of the third order intercept point (TOI)
- Occupied bandwidth (OBW)
- Adjacent channel power (ACP) measurement
- Statistics functions (APD, CCDF)
- Burst power, peak, average and RMS display
- Phase noise
- Bandwidth marker

All IF bandwidths can be selected in both receiver and spectrum analyzer mode:

- EMI bandwidths of 200 Hz, 9 kHz, 120 kHz and 1 MHz in line with CISPR 16-1-1
- Resolution bandwidths (–3 dB) from 10 Hz to 3 MHz (1/3/10 steps)
- 44 digital channel filters from 100 Hz to 5 MHz



Overview of preprogrammed ACP standards for adjacent channel power ratio (ACPR) measurement, which is a power measurement specified in many mobile radio standards.



Statistical signal analysis using the complementary cumulative distribution function (CCDF) provides the precise CCDF trace, average and peak power as well as the crest factor over one million measured values.

Intuitive operation and powerful EMI analysis functions

User-friendly operation as with all EMI test receivers from Rohde&Schwarz

Operation of the R&S®ESCI7 is tailored to applications in EMC labs. The receiver provides great ease of use and a large number of additional functions for analyzing disturbances.

All important parameters are easy to read off on the 8.4"/21 cm TFT color display. The current parameter settings are always clear at a glance. Vertical and horizontal softkey bars help the user to perform complex measurement tasks. Dedicated hardkeys with unit keys are provided for entering values such as frequency and amplitude.

SCAN settings in tabular format

In receiver mode, the SCAN table provides the basis for disturbance measurements in the frequency domain. The parameters are presented in a clear tabular format and can be individually adapted to the measurement and the device under test. The SCAN table can be saved and printed, allowing the user to easily keep track of how the measurement results were produced.

Menu for selecting the main receiver settings (receiver mode). In the upper window, the SPLIT SCREEN display shows the continuously updated level values for the selected detectors (max. three simultaneously) and the set measurement frequency. The lower window shows the measured emission spectrum using the SCAN table settings. Up to three traces with a maximum of 1 million measurement points each can be simultaneously active.

Simultaneous measurement of multiple traces for parallel evaluation

The R&S®ESCI7 can weight up to three measurement traces using different detectors and present them in a diagram.

The benefits are as follows:

- Saving time through simultaneous measurement with different detectors
- Clear identification of measurement traces in the diagram
- Quick overview of results through assignment of limit lines

All measurement data (up to 1 million measurement points per trace) is saved in the internal memory and can be exported in ASCII format. The displayed frequency range is traced back to "real" measured values even when the display is highly zoomed (e.g. during subsequent detailed analysis work). Due to the large number of measurement points, the R&S®ESCI7 in receiver mode delivers high frequency resolution and high accuracy for the disturbance frequency even with scans covering wide frequency ranges. This is a major benefit compared to the spectrum analyzer which has a significantly lower number of sweep points.

In receiver mode, the R&S®ESCI7 is tuned in fixed frequency steps in line with the settings in the SCAN table. The SCAN table can be programmed for a maximum of ten frequency subranges with independent parameter settings (e.g. start/stop frequency, step size, measurement time, resolution bandwidth, input attenuation). Each time a scan is launched by entering a START and STOP frequency, the parameters that are preset in the SCAN table are loaded automatically. This always ensures reproducible and standard-compliant measurements.

Menu for selecting the weighting detectors; the values for a maximum of three different detectors are simultaneously displayed numerically and as an analog bargraph.

Fast, reliable measurements using automatic and interactive test routines

Disturbance measurements become faster and simpler by combining a fast preview measurement with peak (and average) detector and a final measurement exclusively on the automatically determined critical frequencies ("data reduction").

The R&S®ESCI7 provides common limits from commercial product standards and compares them with the result of the preview measurement. It then determines the critical disturbance frequencies and lists them in a table (peak list) which can be manually edited prior to performing the final measurement with a standard-compliant measurement time and CISPR detector(s). This is a way of interactively adding additional frequencies or deleting existing ones.

For disturbance signals that drift in frequency, the R&S®ESCI7 provides a specially modified automatic test sequence called THRESHOLD SCAN. The receiver interrupts the preview measurement as soon as a selectable limit value is exceeded and immediately performs a final measurement using standard-compliant receiver settings. The receiver then continues the preview measurement with the next frequency step. As soon as the limit value is exceeded again, the next final measurement is performed. This technique has a significant benefit: The final measurement, e.g. with quasi-peak weighting, immediately takes place when a critical disturbance level is detected during the preview measurement. This eliminates the risk of measurement errors due to frequency drift of the disturbance signals. The receiver saves the final measurement results in a separate table (peak list) for subsequent evaluation and documentation.

All parameters for the final measurement at the critical frequencies can be configured in a submenu. The final measurement frequencies are determined either for the absolute peaks or as subrange maxima. The relative magnitude of a disturbance level, its offset from the limit value (margin) and the maximum number (1 to 500) can all be set. The final measurement is performed either fully automatically or interactively.

An automatic test sequence consists of preview measurement, data reduction and final measurement. The maximum disturbances and their offset from the set limit value are automatically determined. This speeds up the measurement and simplifies data evaluation. The final measurement frequencies determined in this manner are saved by the R&S®ESCI7 in a separate, editable table (PEAK LIST) for subsequent disturbance analysis and for documentation purposes.

EMI test receiver and spectrum analyzer in a single box – display in MIXED MODE operation

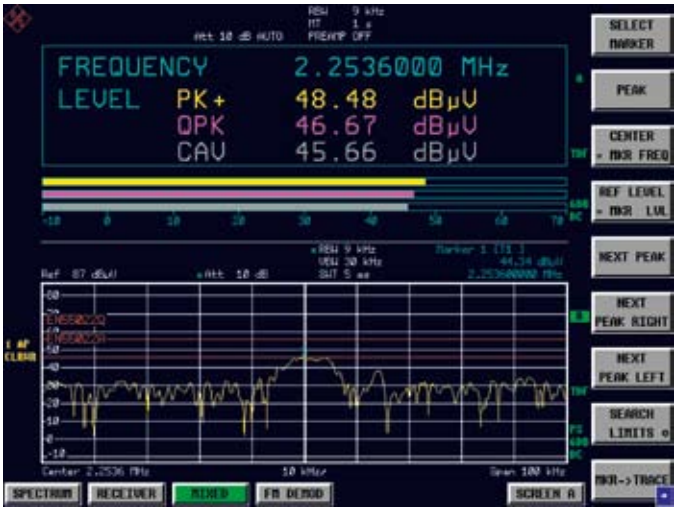
The R&S®ESCI7 combines an EMI test receiver and a spectrum analyzer in a single instrument. The benefits of the analyzer mode are mostly related to disturbance measurements performed in product development with fast sweeps for overview and preview measurements and evaluation using marker functions. The user can choose between standard-compliant CISPR bandwidths (including 1 MHz impulse bandwidth) and 3 dB resolution bandwidths (10 Hz to 3 MHz). For this purpose, preselection filters and a preamplifier can be activated in the analyzer mode. This is a significant advantage compared to a "pure" broadband spectrum analyzer. Operation as a classic EMI test receiver, however, provides sophisticated data reduction and standard-compliant final measurements. In MIXED MODE, the R&S®ESCI7 offers both operating modes in a split-screen presentation.

A large number of the operating parameters can be either coupled or decoupled for the two operating modes. Setting the same center frequency for both screens, for example, automatically produces the same display as in IF analysis. The object is to obtain a spectral display of the RF input signal around the receive frequency within a selectable range. Ideally, this display is output in parallel to a numeric measurement at the current receive frequency. Since the center frequency of the displayed spectrum always corresponds to this receive frequency, the measuring receiver can be tuned very accurately and quickly to the signal of interest.

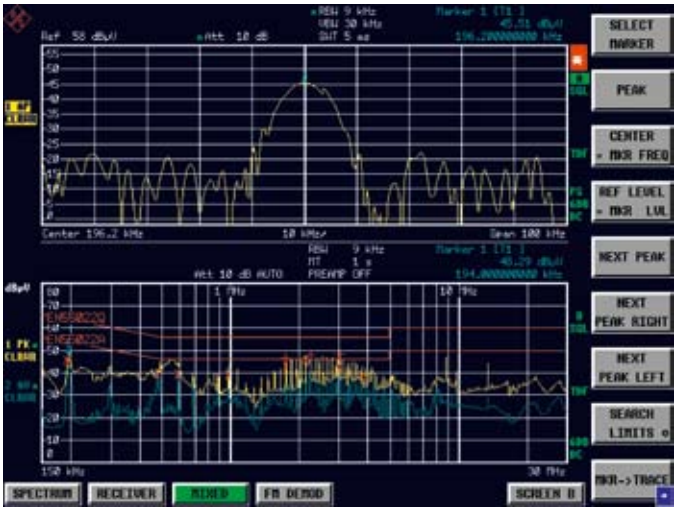
In addition, the user obtains an exact overview of spectrum occupancy around the measurement channel and – if the IF bandwidth is sufficiently large – information about the spectral distribution of a modulated signal in the measurement channel. Any signals received can be quickly classified as disturbance signals or wanted signals, including CW signals present in the form of unmodulated carriers or impulsive disturbances that travel across the screen in the form of narrow lines.

The benefits of this mixed-mode display are as follows:

- More accurate tuning of the EMI test receiver's frequency to the local disturbance maximum
- Faster and simpler identification of signals
- Ideal tool for investigating the spectrum that surrounds disturbance signals



Mixed-mode display: bargraph measurement and spectrum. The standard-compliant measurement in the bargraph display and the fast sweep are shown simultaneously.



Alternative mixed-mode display: receiver scan and spectrum with MARKER TRACK function. The saved frequency scan and fast sweeps around the current marker frequency are displayed simultaneously.

Continuous bargraph display and marker functions for precise measurements

In parallel to the numeric display after weighting with up to three different detectors, the R&S®ESCI7 presents the measured values using a bargraph display. This allows the user to rapidly recognize the influence of changes on the device under test. Even in case of changes of the receive frequency, the bargraph will track the signal without interruption, making it easier to search for the highest signal level. The receiver also records the highest level (MAX HOLD) and the associated frequency, which provides useful support to the user when searching for the highest-amplitude disturbance with fluctuating or drifting signals. At a keystroke (ADD TO PEAK LIST), the R&S®ESCI7 transfers the measured frequency directly to a separate frequency list and saves it for subsequent final measurements.

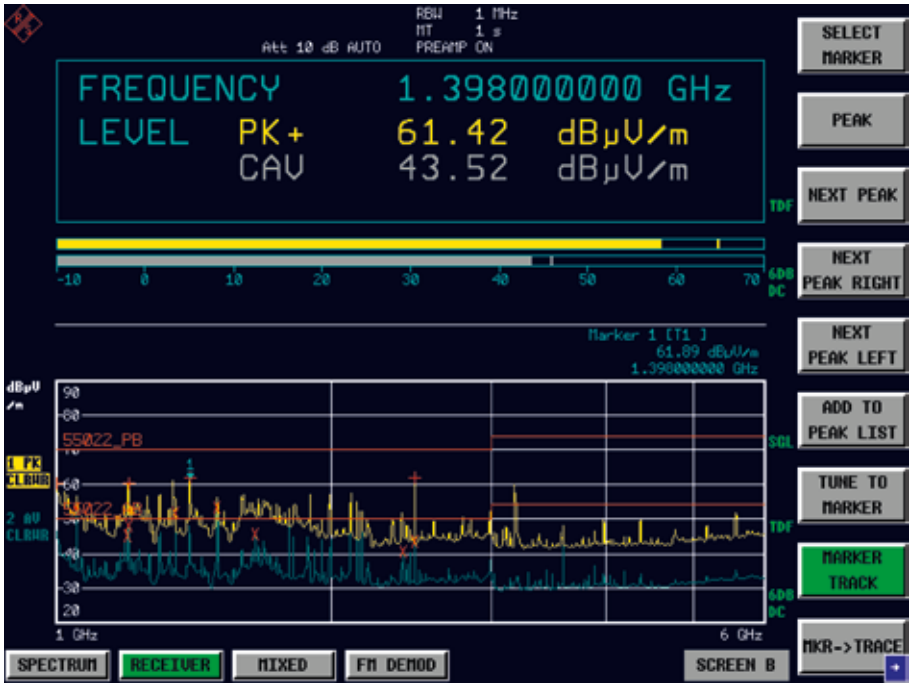
The R&S®ESCI7 supports the evaluation of the displayed measurement trace(s) by means of marker functions, e.g. for fast and reliable determination of frequencies and relative levels. The CENTER = MARKER FREQUENCY and MARKER TRACK functions are also useful. The first function sets the receiver frequency at a keystroke such that the signal to be measured is exactly at the center frequency. When MARKER TRACK is activated, the receive frequency automatically follows the marker on the trace. This allows the user to tune the R&S®ESCI7 quickly and precisely to the individual disturbance maxima in sequence, e.g. with a simple keystroke (NEXT PEAK).

Time-domain analysis – oscilloscope function in receiver mode

The duration of the preview measurement is significantly influenced by the measurement time per frequency step. To reliably measure an impulsive disturbance, for example, the dwell time per frequency step must be set at least as large as the reciprocal of its pulse repetition frequency (PRF). An impulsive disturbance with a PRF of 100 Hz, for example, requires a measurement time of at least 10 ms.

The R&S®ESCI7 features a very useful tool for optimizing this dwell time: time-domain analysis. The user can perform a scan in the time domain on the set receive frequency (similar to the zero span provided by spectrum analyzers) to assess the timing behavior of disturbances – comparable to using an oscilloscope. In this manner, the user can determine the pulse rate of a broadband intermittent disturbance so as to be able to set the optimum measurement time, i.e. as short as possible but as long as necessary. The user can also determine whether and to what extent a narrowband disturbance signal is fluctuating, and whether it is amplitude-modulated or pulsed.

Click-rate analysis is a special application: Thermostatic or program-controlled electrical appliances such as washing machines and air conditioners generate discontinuous disturbances. Due to the aperiodic timing, CISPR 14 and EN 55014 stipulate higher disturbance voltage limits for such click-type disturbances than for continuous



The R&S®ESCI7 allows precise evaluation of all measurement traces using marker and zoom functions. The MARKER TRACK and TUNE TO MARKER functions link the frequency tuning and numeric level measurement to the marker position on the trace. Final measurements at the critical frequencies determined in this way can be performed more quickly and easily.

disturbances. If the user wants to apply these limits, it is necessary to measure the length in time of the clicks, their repetition rate (click rate) and their levels in order to then use these values to determine the applicable limits.

Clicks are normally measured using special click-rate analyzers. The time-domain analysis capability integrated into the R&S®ESCI7 can consecutively determine the pulse height and duration at each of the frequencies stipulated in the standard and thus reproduce the functionality of an expensive click-rate analyzer. The R&S®ESCI7 fulfills CISPR 16-1-1 in terms of the accuracy of the pulse duration measurement for pulse durations equal to 10 ms. With a capacity of 1.44 million measured values in the time domain, it has sufficient memory to continuously record the peak value and quasi-peak value for at least two hours. A PC-based software is available for evaluation in line with CISPR 14-1/EN 55014-1.

Automatic disturbance voltage measurements using remote-controllable line impedance stabilization networks (LISN) from Rohde & Schwarz

Disturbance voltage measurements on power lines are made using line impedance stabilization networks. For this application, Rohde & Schwarz offers the R&S®ENV216 two-line V-network and the R&S®ESH2-Z5 and R&S®ENV4200 four-line V-networks. The R&S®ESCI7 automatically switches the different phases of this LISN using an optional control cable. This ensures that the largest disturbance is actually measured.

Predefined transducer factors

For disturbance measurements using test antennas for example, the R&S®ESCI7 includes a selection of typical antenna factors (transducers). Users can also create and save their own correction tables for antennas, cable losses, preamplifiers, etc. The R&S®ESCI7 automatically takes into account all activated correction factors in the measured values and selects the appropriate unit.

Library of limit lines for commercial standards

In addition to the transducer factors, the R&S®ESCI7 also includes a selection of important limits (LIMIT LINES) in line with commercial standards. Users can enter and save changes to the limit lines and create new limit lines using a tabular format.

R&S®ENV216 two-line V-network (LISN).

Integrates perfectly into the work environment

Easy expansion or upgrading by means of options

Scalar network analysis

The optional R&S®FSP-B9 (internal tracking generator, 9 kHz to 3 GHz) and R&S®FSP-B10 (external generator control) expand the R&S®ESCI7 to operate as a scalar network analyzer. The selective measurement technique allows gain, frequency response, insertion loss and return loss to be measured with a wide dynamic range and without being influenced by generator harmonics or spurious.

The R&S®FSP-B9 internal tracking generator covers the frequency range from 9 kHz to 3 GHz. A frequency offset of ±150 MHz can be set for testing frequency-converting modules. The tracking generator can be broadband-modulated using an external I/Q baseband signal.

The R&S®FSP-B10 option uses commercially available RF signal generators as an external tracking source. They are controlled via the IEC/IEEE bus or a TTL bus. The range of functions corresponds to that of the internal tracking generator.

RF level measurement

The R&S®FSP-B6 option provides a selectable RF level trigger for measurements on pulsed RF signals used in TDMA communications systems.

Modulation measurement

Using the R&S®FS-K7 measurement demodulator option, the R&S®ESCI7 can measure synthesizer settling or frequency deviation, for example. This option also enables Fourier analysis of the RF signal or the demodulated AF signal.

Display choices:

- Frequency, amplitude or phase modulation versus time
- Carrier power versus time
- RF spectrum (FFT)
- AF spectrum (FFT of demodulated signal) with measured SINAD and THD values

Extensive documentation and networking capabilities like a PC

The R&S®FSP-B16 LAN interface option configures the R&S®ESCI7 like a network workstation:

- File logging on network drives
- Network printer
- Remote desktop function
- Remote control via LAN

The Windows XP Embedded operating system and the diverse data interfaces allow smooth integration of the instrument into a PC environment.

For further processing, the R&S®ESCI7 saves the measured values as ASCII files to document the trace data as well as the most important instrument settings.

Documentation of measurement results, graphics, scan tables and transducer/limit value tables can be conveniently handled by connecting a printer to one of the USB interfaces on the front or rear panel. This ensures the complete, reproducible evaluation of tests also as a hard copy.

For software integration, instrument drivers are available free of charge for LabView, LabWindows/CVI and VXI Plug&Play.

Computer-controlled measurement of disturbances and automated EMI test routines using R&S®ES-SCAN and R&S®EMC32

The R&S®ES-SCAN and the R&S®EMC32 EMI measurement software products complement the R&S®ESCI7. R&S®ES-SCAN is a cost-effective and user-friendly Windows software that was specially created for disturbance measurements during development. R&S®EMC32 is a modular test software that supports manual as well as partially or fully automated EMC measurements in line with commercial and military standards. It ensures reliable recording, evaluation, documentation and traceability of measurement results.

Always up-to-date with free firmware updates

The R&S®ESCI7 firmware is easy to update using a USB memory stick or the LAN interface. Firmware updates are available free of charge from the Rohde&Schwarz website.

Rugged and environmentally friendly, suitable even for field applications

Housing option for outdoor use

The R&S®ESCI7 is also available in a rugged housing with shock-absorbing corners and a carrying handle for outdoor use (R&S®FSP-B1 option).

AC-independent operation using DC power supply and battery pack (option)

The R&S®FSP-B30 DC power supply option allows operation from DC sources between 12 V and 28 V.

Using the R&S®FSP-B31 battery pack, the receiver can record measurement sequences continuously for several hours during applications in the field. The time can be extended as required using additional battery packs.

Flash disk option for expanded environmental specifications

A hard drive is normally used to save data in the R&S®ESCI7. For applications with above-average fluctuations of the operating temperature (0 °C to +55 °C) or when the instrument is subjected to strong shocks and vibrations (e.g. in a vehicle), the user can order an internal flash disk (R&S®ESCI-B20 option) instead of the internal hard disk.

Rear panel of the R&S®ESCI7.

Specifications in brief

Base unit		
Frequency range		9 kHz to 7 GHz
Frequency resolution		0.01 Hz
Frequency accuracy	standard	1×10^{-6}
	with R&S®FSP-B4 (OCXO) option	1×10^{-7}
External reference frequency		10 MHz
Measurement time	receiver mode/scan (per frequency step)	selectable from 33 µs to 100 s
	analyzer mode/sweep time	selectable from 2.5 ms to 16000 s, zero span from 1 µs to 16000 s
Resolution bandwidth	analyzer mode (–3 dB)	10 Hz to 3 MHz in steps of 1/3/10
	receiver mode (EMI)	200 Hz, 9 kHz, 120 kHz (–6 dB), 1 MHz (impulse bandwidth)
Video bandwidth	analyzer mode	1 Hz to 10 MHz in steps of 1/3/10
Preselection	can be turned off in analyzer mode	12 fixed/continuously tunable filters
Preamplifier	can be switched on/off	20 dB gain
Level		
Max. RF level (CW)	input attenuation ≥ 10 dB	30 dBm (= 1 W)
Max. pulse energy	input attenuation ≥ 10 dB, 10 µs	1 mWs
Max. pulse voltage	input attenuation ≥ 10 dB, 10 µs	150 V
Third-order intercept (IP3)	without preselection/preamplifier, from 200 MHz to 3 GHz	> 7 dBm, typ. 10 dBm
	with preselection/without preamplifier, from 200 MHz to 3 GHz	> 2 dBm, typ. 5 dBm
1 dB compression	f > 200 MHz, input attenuation 0 dB, without preselection/preamplifier	5 dBm, nominal
Total measurement uncertainty	95% confidence level	
	< 3 GHz	
	without preselection/preamplifier	0.5 dB
	with preselection/preamplifier	1.0 dB
	3 GHz to 7 GHz	
	without preselection/preamplifier	1.5 dB
	with preselection/preamplifier	1.5 dB
Displayed average noise level (DANL)	receiver mode, nominal, input attenuation 0 dB, termination 50 Ω	
	without preamplifier, 1 MHz, BW = 9 kHz	< –4 dBµV
	without preamplifier, 30 MHz to 1 GHz, BW = 120 kHz	< 6 dBµV
	with preamplifier, 1 MHz, BW = 9 kHz	< –14 dBµV
	with preamplifier, 30 MHz to 1 GHz, BW = 120 kHz	< –4 dBµV
Detectors	receiver mode	max./min. peak, quasi-peak, RMS, average, average with meter time constant (CISPR-average), RMS-average (CISPR-RMS)
Number of measurement points	analyzer mode	125 to 8001 (default 501)
	receiver mode	max. 1 million (frequency domain) max. 1.44 million (time domain)

The data sheet with complete technical specifications is available at PD 0758.1558.22 and www.rohde-schwarz.com.

Ordering information

Designation	Type	Order No.
Base unit		
EMI Test Receiver, 9 kHz to 7 GHz	R&S®ESCI7	1166.5950.07
Accessories supplied		
Power cable, Tuchel adapter for probe connector, operating manual, service manual		
Options		
Rugged Case, with carrying handle	R&S®FSP-B1	1129.7998.02
OCXO Reference Frequency	R&S®FSP-B4	1129.6740.02
TV Trigger/RF Power Trigger	R&S®FSP-B6	1129.8594.02
Tracking Generator, I/Q Modulator	R&S®FSP-B9	1129.6991.02
External Generator Control	R&S®FSP-B10	1129.7246.03
LAN Interface 100BaseT	R&S®FSP-B16	1129.8042.03
Expanded Environmental Specifications (flash disk)	R&S®ESCI-B20	1155.1606.14
DC Power Supply [1]	R&S®FSP-B30	1155.1158.02
Battery Pack, with charging unit [2]	R&S®FSP-B31	1155.1258.02
Spare Battery Pack (NiMH) [3]	R&S®FSP-B32	1155.1506.02
Noise Measurement Software	R&S®FS-K3	1057.3028.02
FM Measurement Demodulator	R&S®FS-K7	1141.1796.02
Recommended extras		
19" Rack Adapter (not with R&S®FSP-B1)	R&S®ZZA478	1096.3248.00
Carrying Case, gray	R&S®ZZT473	1109.5048.00
Pulse Limiter, 0 Hz to 30 MHz	R&S®ESH3-Z2	0357.8810.54
Control Cable for R&S®ESH2-Z5 V-network (length 2 m)	R&S®EZ-13	1026.5293.02
Control Cable for R&S®ESH3-Z5 V-network (length 2 m)	R&S®EZ-14	1026.5341.02
Control Cable for R&S®ENV216, R&S®ENV4200 V-network (length 3 m)	R&S®EZ-21	1107.2087.03
IEC/IEEE Bus Cable, length 1 m	R&S®PCK	0292.2013.10
IEC/IEEE Bus Cable, length 2 m	R&S®PCK	0292.2013.20
EMC measurement software		
EMI Precompliance Software for R&S®ESPI, R&S®ESCI, R&S®ESL EMI test receivers and R&S®FSP, R&S®FSL analyzers; VISA software interface from National Instruments required	R&S®ES-SCAN	1308.9270.02
EMI Measurement Software; basic version for commercial and military standards; with hardlock copy protection	R&S®EMC32-EB	1300.7010.02
EMI Auto Test Option for R&S®EMC32-EB	R&S®EMC32-K10	1117.6840.02
Sequencer for EMC measurements	R&S®EMC32-K11	1117.6862.02
Service options		
One-Year Repair Service following the warranty period	R&S®RO2ESCI7	1166.5950.S26
Two-Year Repair Service following the warranty period	R&S®RO3ESCI7	1166.5950.S22
Four-Year Repair Service following the warranty period	R&S®RO5ESCI7	1166.5950.S24
Two-Year Calibration Service	R&S®CO2ESCI7	1166.5950.S25
Three-Year Calibration Service	R&S®CO3ESCI7	1166.5950.S21
Five-Year Calibration Service	R&S®CO5ESCI7	1166.5950.S23
Documentation of Calibration Values of the R&S®ESCI7	R&S®DCV-2	0240.2193.09
R&S®ESCI7 DKD (ISO 17025) Calibration incl. ISO 9000 calibration	R&S®ESCI7DKD	1161.2646.07

[1] R&S®FSP-B1 option required.
[2] R&S®FSP-B1 and R&S®FSP-B30 options required.
[3] R&S®FSP-B31 option required.

Service you can rely on

- Worldwide
- Local and personalized
- Customized and flexible
- Uncompromising quality
- Long-term dependability

About Rohde&Schwarz

Rohde&Schwarz is an independent group of companies specializing in electronics. It is a leading supplier of solutions in the fields of test and measurement, broadcasting, radiomonitoring and radiolocation, as well as secure communications. Established 75 years ago, Rohde&Schwarz has a global presence and a dedicated service network in over 70 countries. Company headquarters are in Munich, Germany.

Environmental commitment

- Energy-efficient products
- Continuous improvement in environmental sustainability
- ISO 14001-certified environmental management system

Certified Quality System
ISO 9001

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PD 5214.2762.12 | Version 01.00 | August 2009 | R&S®ESCI7

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*0.14 €/min within German wireline network; rates may vary in other networks (wireline and mobile) and countries.